MIPP Beam Intensity during May 2005 to Feb 2006

Holger Meyer
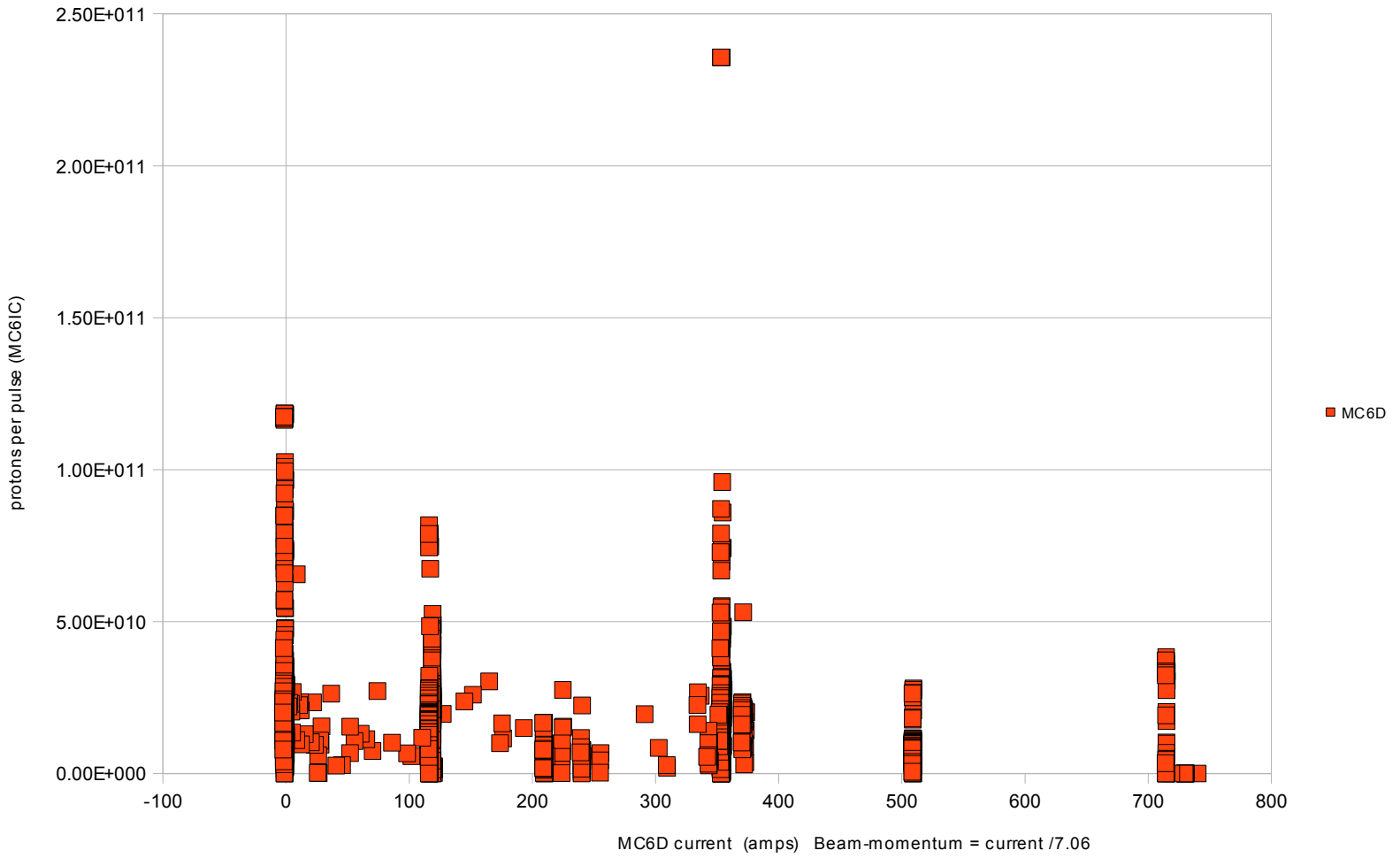Wichita State University
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From 10 May 2005 to Feb. 2006 beam was provided to MC7 in 4 second spills. Here we report the maximum intensity in ppp (protons per pulse) and protons per second used at various momentum settings of the secondary beam line, beams ranging from -85 GeV/c to +120 GeV/c.

The intensity was measured with the ionization chamber MC6IC just upstream of the MIPP primary target. The beam momentum and polarity are determined from the current and polarity of MC6D. Beam momentum in GeV/c is proportional to MC6D current in amps. MC6D polarity was obtained from the fifth status bit of F|MC6D readback. The data used was logged in regular time intervals unsynchronized to the slow spills. MC6IC was reset after integrating over a spill ($20 and $21 events) and thus was read back as zero approximately six of ten times. The remaining data are used here. Full historic data is available through Acnet LumberJack (page D44), but this did not work through the Java Acnet console from off-site.

The data for ~16,000 beam spills is shown in the two plots for positive and negative beams. The table that follows summarizes the peak intensities for each momentum with some comments. The majority particles in the secondary beam could not always be prescaled to trigger equal samples of pi, K, and p events while saturating the trigger rate. With higher DAQ rate in an upgraded experiment we may want to increase beam rates if the beam backgrounds remain low.

Secondary beam momentum	Primary beam intensity (ppp)	Primary beam intensity (prot. per sec.)	Comment
-85	1.21E+011	3.00E+010	1.5(pbar) : 10(K) : 100(pi) beam ratio in recorded events
-58	1.21E+011	3.00E+010	1(pbar) : 6(K) : 7(pi) beam ratio in recorded events
-35	6.00E+010	1.50E+010	
-20	1.15E+011	2.90E+010	
-5	1.21E+011	3.00E+010	
5	1.21E+011	3.00E+010	
20	8.00E+010	2.00E+010	
35	3.00E+010	7.50E+009	
58	9.50E+010	2.40E+010	
85	3.50E+010	7.63E+009	
120	4.50E+010	1.13E+010	Protons only, primary beam to experimental target

Primary beam intensity versus Secondary beam energy for positive secondarybeam

Primary beam intensity versus Secondary beam energy for negative secondary beam

protons per pulse (MC6IC)

1.40E+011

1.20E+011

1.00E+010

8.00E+010

6.00E+010

4.00E+010

2.00E+010

0.00E+000

-100   0   100   200   300   400   500   600   700   800

MC6D current

■ MC6D